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INTRODUCTION.

This REVIEW treats generally the meteorological conditions of the United States and Canada for March, 1889, and is based upon reports of regular and voluntary observers of both countries.

On chart i the paths of the centres of nine areas of low pressure are shown; the average number traced for March during the last fifteen years being 11.7. This chart also exhibits the approximate paths of the centres of twelve depressions traced over the north Atlantic Ocean; the limits of fog-belts west of the fortieth meridian, and the distribution of field ice during the month. Unusually severe weather prevailed over the western part of the north Atlantic, and there was a remarkable deficiency of Arctic ice, this being the first March in the last eight years for which large quantities of icebergs and field ice were not reported over and near the Banks of Newfoundland. The areas of high and low pressure and north Atlantic storms are discussed under their respective headings.

Chart ii exhibits the distribution of mean atmospheric pressure and temperature for the month. The mean temperature was generally above the normal, except in districts lying south of the thirty-fifth parallel and east of the one hundred and twelfth meridian. The greatest departures above the normal occurred in the north-central part of the country, where, at stations, they exceeded 15°. The departures below the normal were less than 5°, except in the lower Rio Grande valley. At a number of stations distributed from the Atlantic to the Pacific oceans the highest absolute temperature noted during the periods of observation was reported.

The distribution of precipitation for March, 1889, is shown on chart iii, and the normal precipitation for eighteen years is exhibited on chart iv. A notable feature of the precipitation of the month was the heavy rainfall on the middle and southern Pacific coast, where more than double the usual amount of rainfall for March fell. In Florida the precipitation exceeded the normal by nearly one hundred per cent. The greatest deficiency occurred in the upper lake region, where forty per cent. of the normal fell, and in the Ohio Valley, Tennessee, the extreme Northwest, and upper Mississippi valley, where about one-half the usual amount was reported.

Chart v exhibits the depth of snow on the ground at the close of the month, and the limits of freezing weather during March, 1889.

Commencing with July, 1888, the meteorological means for the regular stations of the Signal Service have been determined from observations taken twice daily at 8 a. m. and 8 p. m. (75th meridian time). These hours of observation have been permanently adopted to supersede the former system of tri-daily observations taken at eight-hour intervals. The monthly mean temperature for Signal Service stations represents the mean of the maximum and minimum temperatures.

In the preparation of this REVIEW data from 1,969 stations have been used, classified as follows: 175 Signal Service stations; 108 monthly registers from United States Army post surgeons; 1,182 monthly registers from state weather service and voluntary observers; 23 Canadian stations; 165 stations, through the Central Pacific Railway Company; 316 marine reports through the co-operation of the Hydrographic Office, United States Navy; marine reports through the "New York Herald Weather Service;" monthly weather reports from the local weather services of Alabama, Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New England, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, Tennessee, and Texas; international simultaneous observations; trustworthy newspaper extracts, and special reports.

ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for March, 1889, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on chart ii by isobars. On July 1, 1888, the tri-daily observations of the Signal Service were superseded by observations taken twice daily at the hours named. A protracted series of hourly observations has shown that the difference is almost inappreciable between the mean pressure obtained from two observations taken at these hours and that determined from tri-daily observations taken at eight-hour intervals.

For March, 1889, the mean pressure was highest within an area bounded by the isobar of 30.10, which extended from Manitoba southward to Kansas, the highest reading, 30.12, being noted at Bismarck, Dak. From this region there was a decrease in mean pressure westward to the north Pacific coast, where the readings fell below 29.90; southward to the southeastern slope of the Rocky Mountains, where the means were below 30.00; and eastward to Nova Scotia, where values falling below 29.85 were shown, the lowest mean reading reported, 29.82, being noted at Yarmouth, N. S. Within a well-defined area of relatively low mean pressure which occupied southeastern California and southwestern Arizona, and along the Pacific coast north of the fortieth parallel, the values fell below 29.95.

A comparison of the March, 1889, pressure chart with that of the preceding month shows a general decrease in pressure over the United States and Canada, the decrease being most marked from Oregon southeastward over the middle plateau region, on the middle Gulf coast, and along the middle Atlantic and North Carolina coasts, where at stations the mean readings were .25, or more, below those of February, 1889. Over the extreme southwestern part of California the decrease amounted to but .05; over the north-central portion of the country, and at the mouth of the Rio Grande River, to .10 or less, and over southern Florida to .12. The area of highest mean pressure